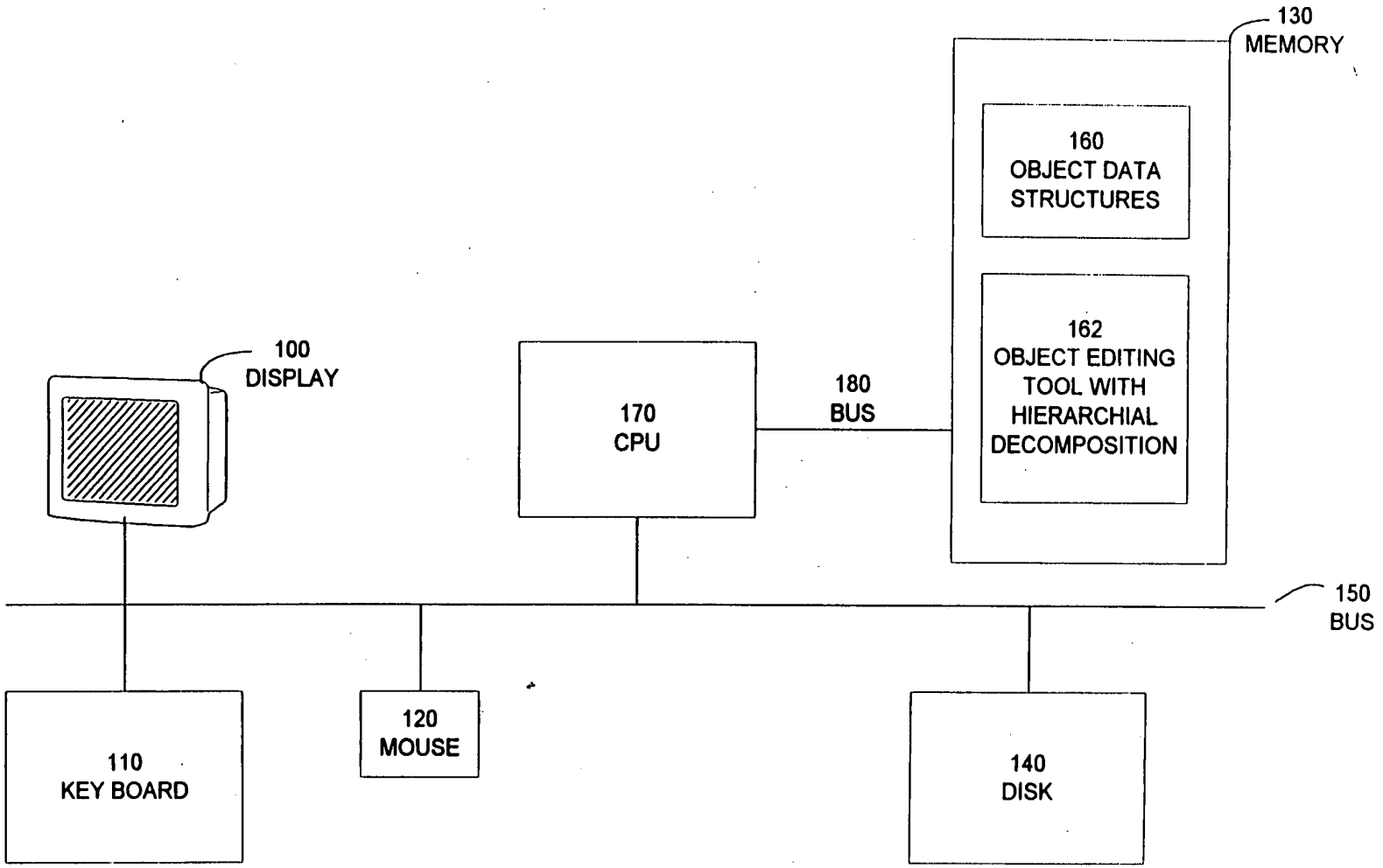
130
MEMORY
160
OBJECT DATA
STRUCTURES
162
OBJECT EDITING
TOOL WITH
HIERARCHIAL
DECOMPOSITION
100
DISPLAY
170
CPU
180
BUS
150
BUS
110
KEY BOARD
120
MOUSE
140
DISK

FIG. 1

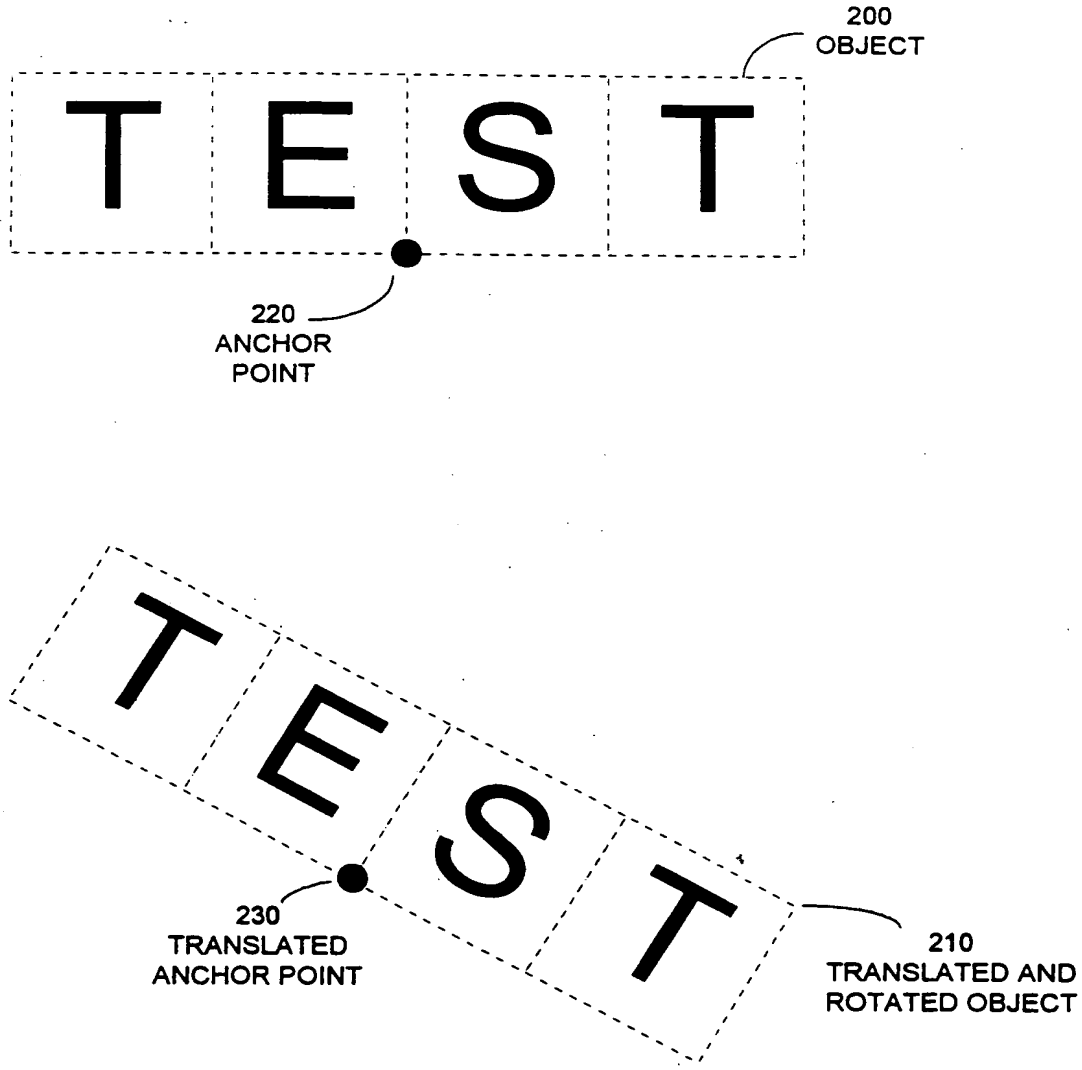
200
OBJECT
T E S T
220
ANCHOR
POINT
T E S T
230
TRANSLATED
ANCHOR POINT
210
TRANSLATED AND
ROTATED OBJECT

FIG. 2

$$M = M\_ANCHOR * M\_RESIZE * M\_SKEW * M\_ROTATE * M\_TRANSLATE$$

$$M\_ANCHOR = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ XANCHOR & YANCHOR & 1 \end{bmatrix}$$

$$M\_RESIZE = \begin{bmatrix} XRESIZE & 0 & 0 \\ 0 & YRESIZE & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$M\_SKEW = \begin{bmatrix} 1 & YSKEW & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$M\_ROTATE = \begin{bmatrix} COS(BETA) & SIN(BETA) & 0 \\ -SIN(BETA) & COS(BETA) & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$M\_TRANSLATE = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ XPOSITION & YPOSITION & 1 \end{bmatrix}$$

FIG. 3

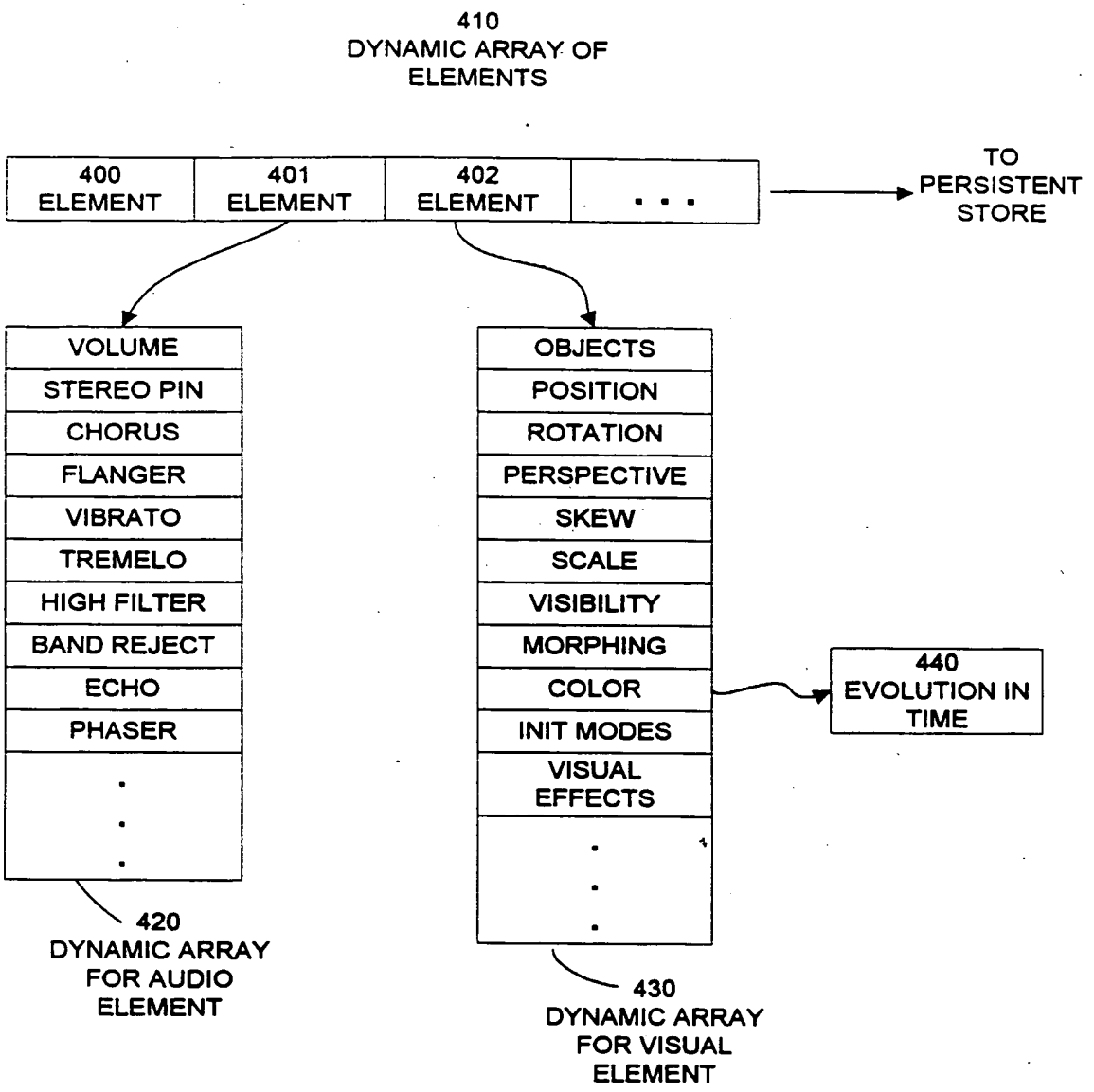
410
DYNAMIC ARRAY OF ELEMENTS
400 ELEMENT
401 ELEMENT
402 ELEMENT
TO PERSISTENT STORE
VOLUME
STEREO PIN
CHORUS
FLANGER
VIBRATO
TREMELO
HIGH FILTER
BAND REJECT
ECHO
PHASER
420
DYNAMIC ARRAY FOR AUDIO ELEMENT
OBJECTS
POSITION
ROTATION
PERSPECTIVE
SKEW
SCALE
VISIBILITY
MORPHING
COLOR
INIT MODES
VISUAL EFFECTS
440
EVOLUTION IN TIME
430
DYNAMIC ARRAY FOR VISUAL ELEMENT

FIG. 4

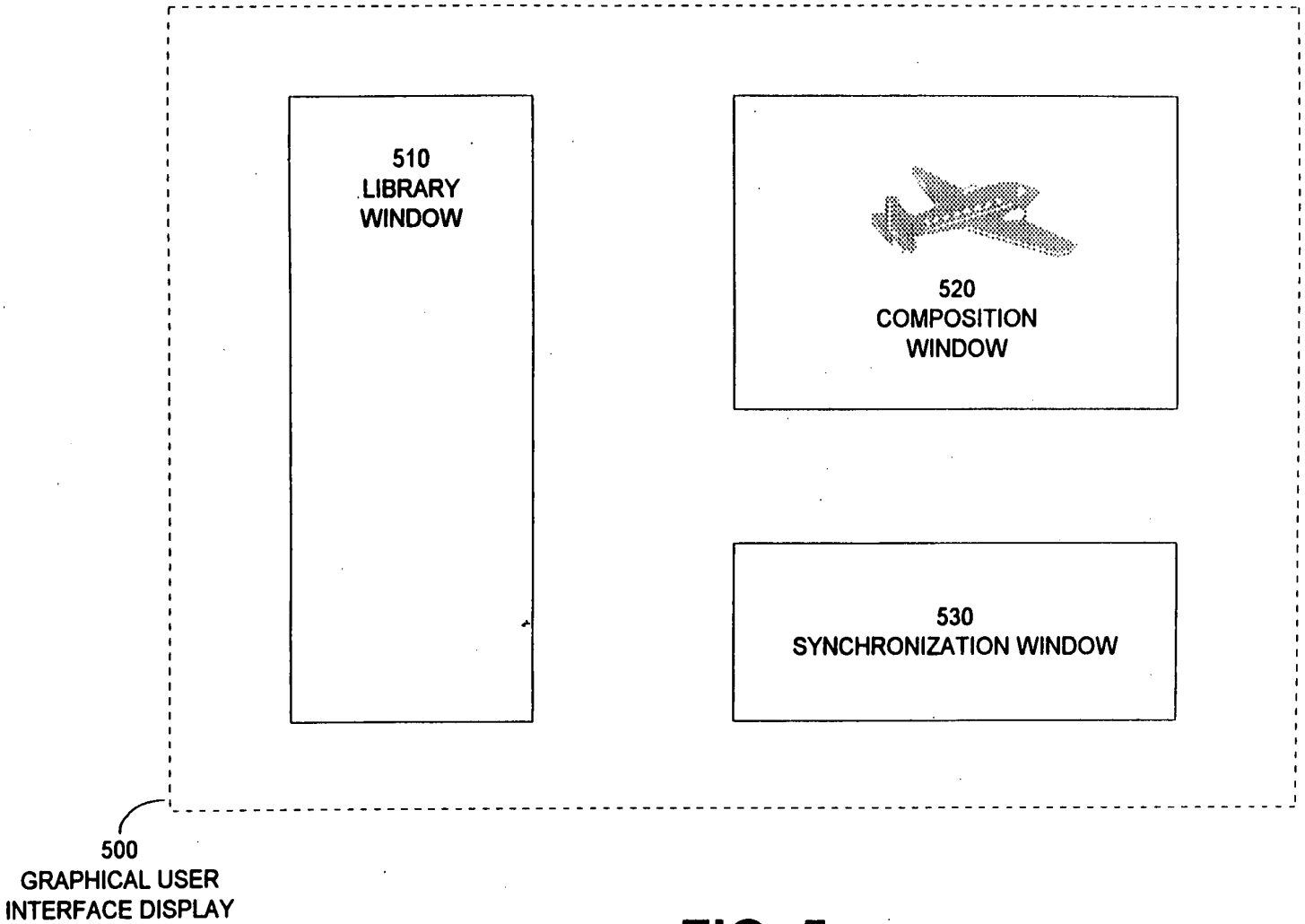

FIG. 5

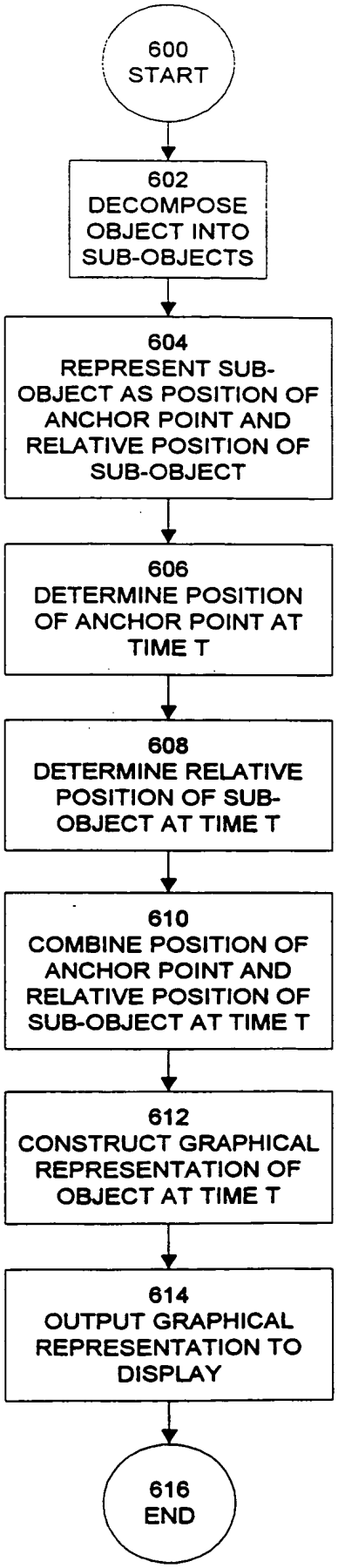
600
START
602
DECOMPOSE OBJECT INTO SUB-OBJECTS
604
REPRESENT SUB-OBJECT AS POSITION OF ANCHOR POINT AND RELATIVE POSITION OF SUB-OBJECT
606
DETERMINE POSITION OF ANCHOR POINT AT TIME T
608
DETERMINE RELATIVE POSITION OF SUB-OBJECT AT TIME T
610
COMBINE POSITION OF ANCHOR POINT AND RELATIVE POSITION OF SUB-OBJECT AT TIME T
612
CONSTRUCT GRAPHICAL REPRESENTATION OF OBJECT AT TIME T
614
OUTPUT GRAPHICAL REPRESENTATION TO DISPLAY
616
END

FIG. 6

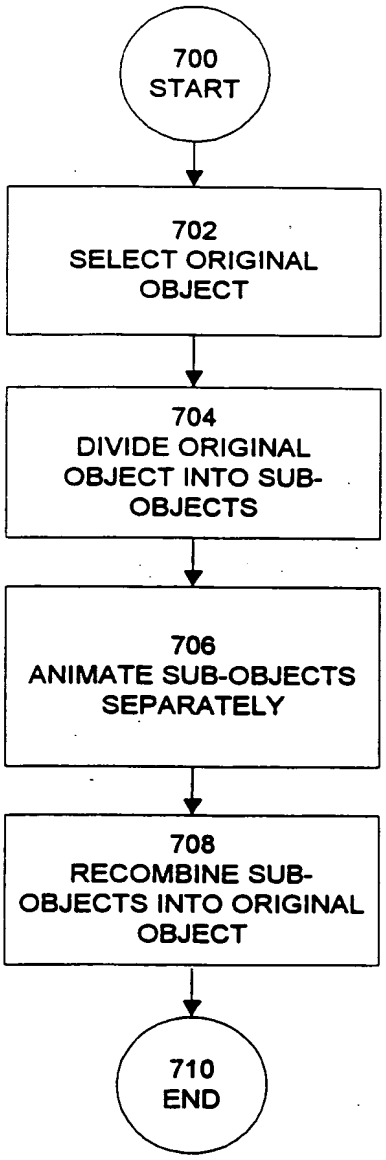
700
START
702
SELECT ORIGINAL OBJECT
704
DIVIDE ORIGINAL OBJECT INTO SUB-OBJECTS
706
ANIMATE SUB-OBJECTS SEPARATELY
708
RECOMBINE SUB-OBJECTS INTO ORIGINAL OBJECT
710
END

FIG. 7

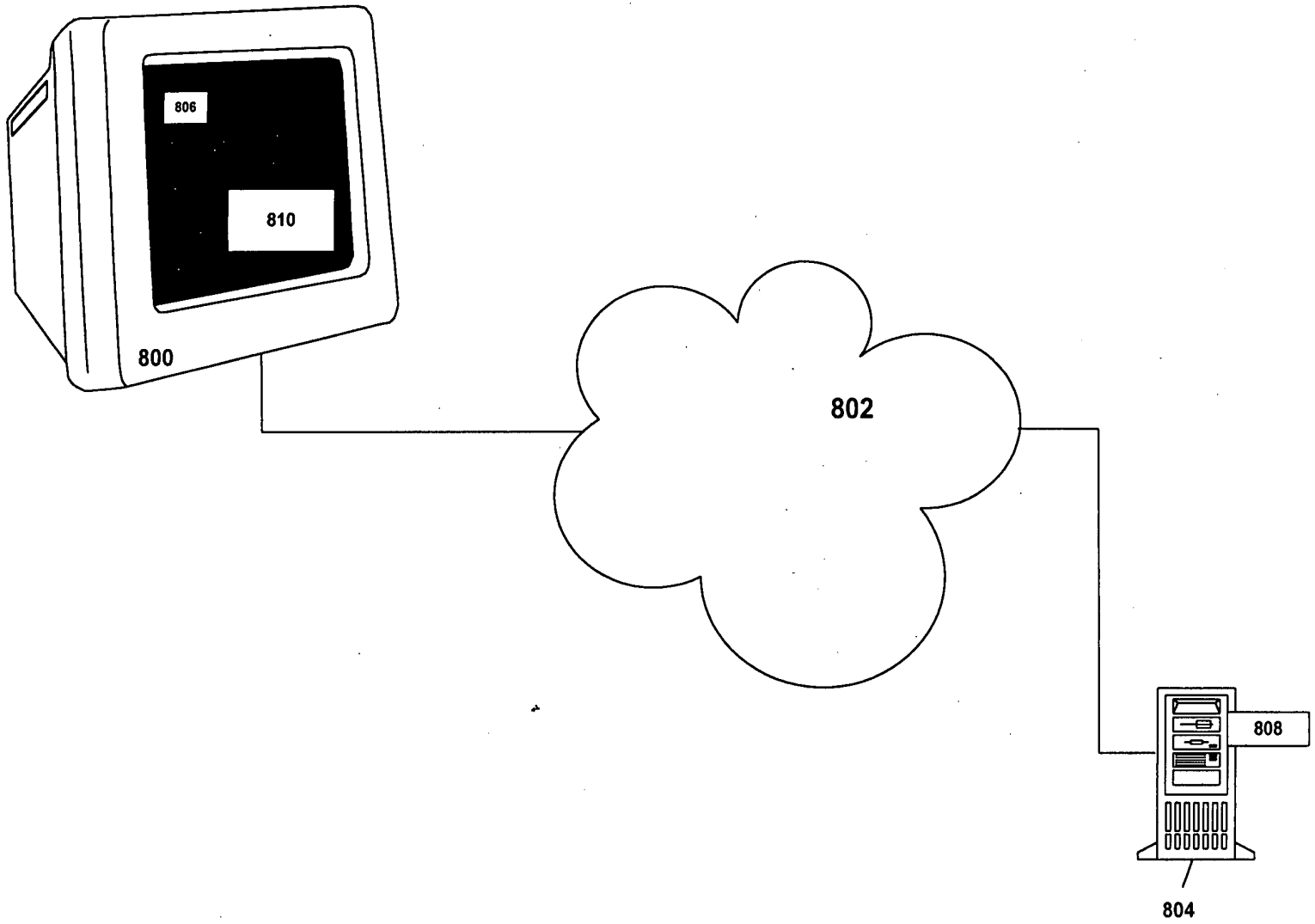

FIGURE 8

A B C D E

902

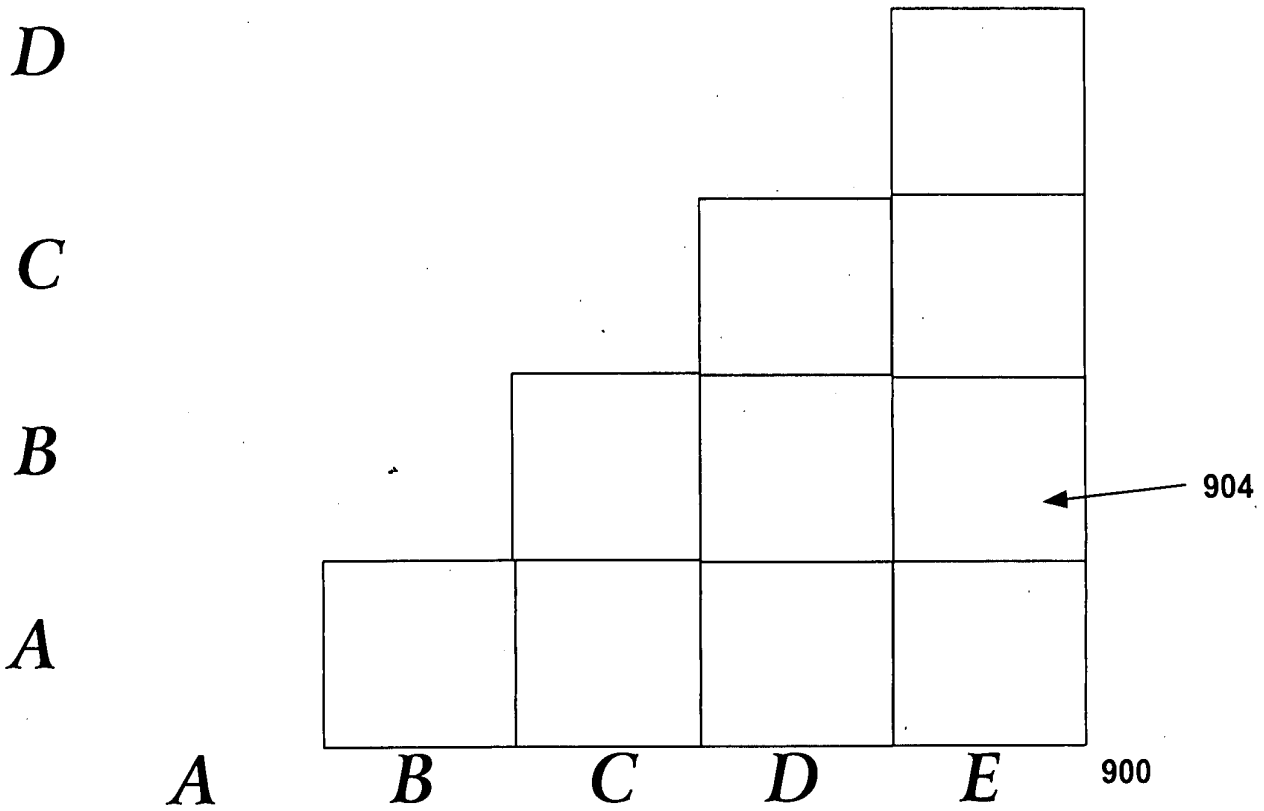

FIGURE 9